'''

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Subject:- Computer Graphics

c) Write C++ program to generate fractal patterns by using Koch curves.

'''

#include <iostream>

#include <math.h>

#include <graphics.h>

using namespace std;

class kochCurve

{

public:

void koch(int it, int x1, int y1, int x5, int y5)

{

int x2, y2, x3, y3, x4, y4;

int dx, dy;

if (it == 0)

{

line(x1, y1, x5, y5);

}

else

{

delay(10);

dx = (x5 - x1) / 3;

dy = (y5 - y1) / 3;

x2 = x1 + dx;

y2 = y1 + dy;

x3 = (int)(0.5 \* (x1 + x5) + sqrt(3) \* (y1 - y5) / 6);

y3 = (int)(0.5 \* (y1 + y5) + sqrt(3) \* (x5 - x1) / 6);

x4 = 2 \* dx + x1;

y4 = 2 \* dy + y1;

koch(it - 1, x1, y1, x2, y2);

koch(it - 1, x2, y2, x3, y3);

koch(it - 1, x3, y3, x4, y4);

koch(it - 1, x4, y4, x5, y5);

}

}

};

int main()

{

kochCurve k;

int it;

cout << "Enter Number Of Iterations : " << endl;

cin >> it;

int gd = DETECT, gm;

initgraph(&gd, &gm, NULL);

k.koch(it, 150, 20, 20, 280);

k.koch(it, 280, 280, 150, 20);

k.koch(it, 20, 280, 280, 280);

getch();

closegraph();

return 0;

}